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(54) **TACTICAL FLOTATION SAFETY SYSTEM**

USPC 441/92, 106, 107, 108, 117, 119
See application file for complete search history.

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10, 2011.

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B63C 9/125 (2006.01)
F41H 1/02 (2006.01)

(52) **U.S. Cl.**
CPC **B63C 9/1255** (2013.01); **F41H 1/02**
(2013.01)

(58) **Field of Classification Search**
CPC B63C 9/00; B63C 9/15; B63C 9/125;
B63C 9/1255; B63C 9/155; F41H 1/00;
F41H 1/02

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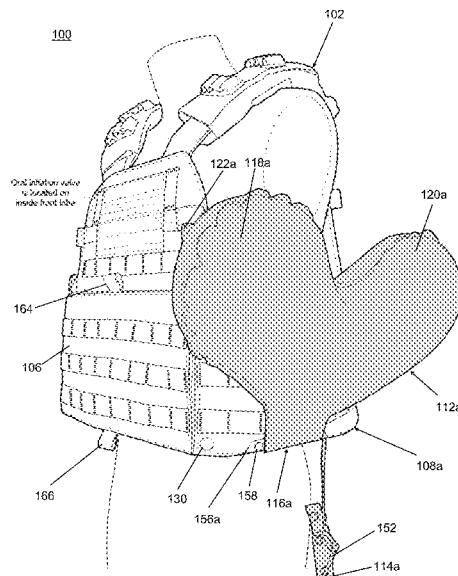
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(57) **ABSTRACT**

A tactical flotation safety system having a tactical flotation safety vest attachment removably attached to a tactical vest. The tactical flotation safety vest attachment has two side panels adjustably attached at the back and which are secured at the front and back of the tactical vest with cover panels. The two side panels include inner flaps and outer flaps enclosing inflation bladders and inflation mechanisms. The inflation mechanisms are secured to the interiors of the side panels and connected to exterior handles. When necessary, a user may deploy the inflation bladders by pulling on the handles to activate a pressurized gas source, such as liquid carbon dioxide cartridges of the inflation mechanism thereby inflating the bladders to provide buoyancy to the user.

13 Claims, 12 Drawing Sheets



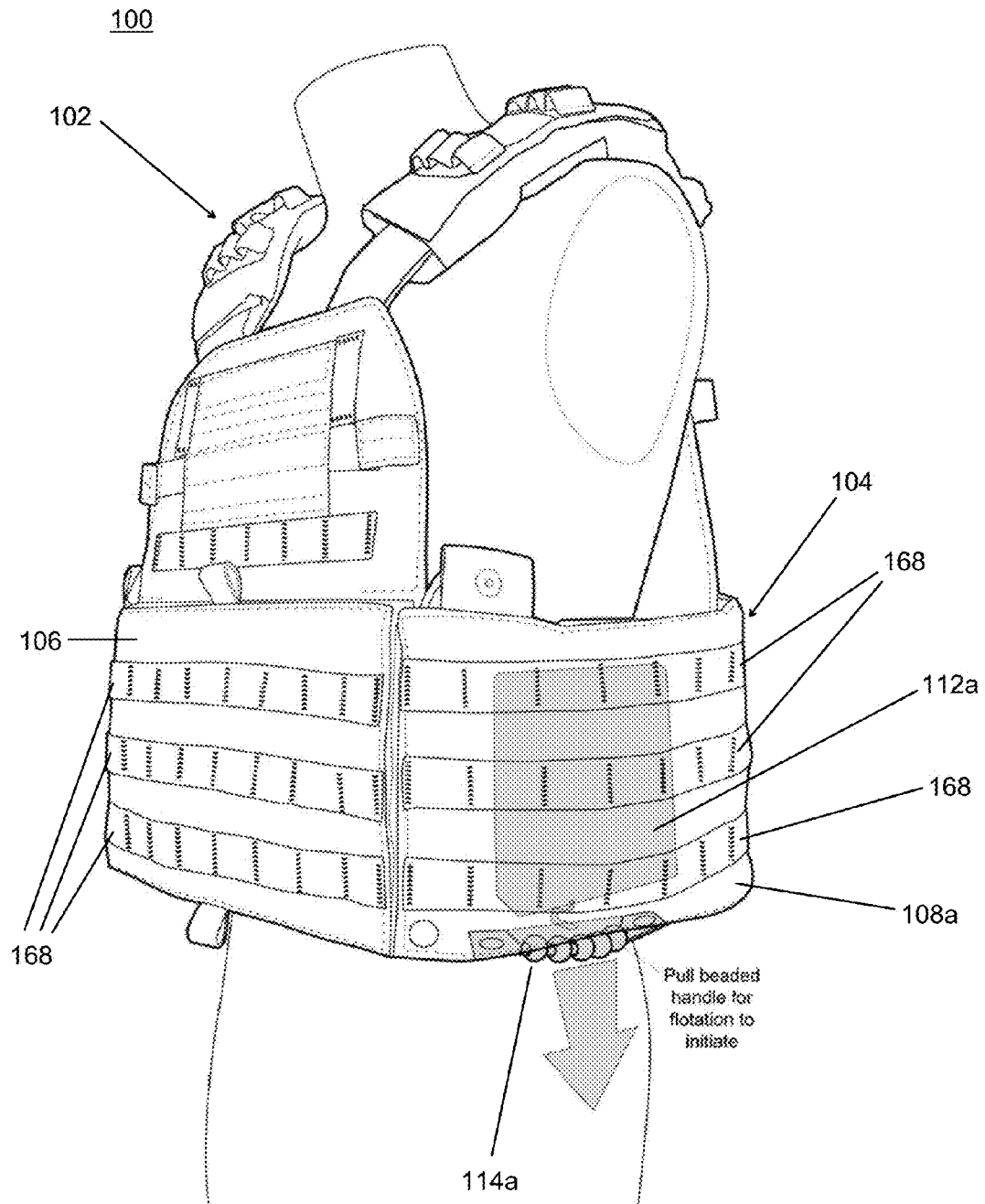


FIG. 1

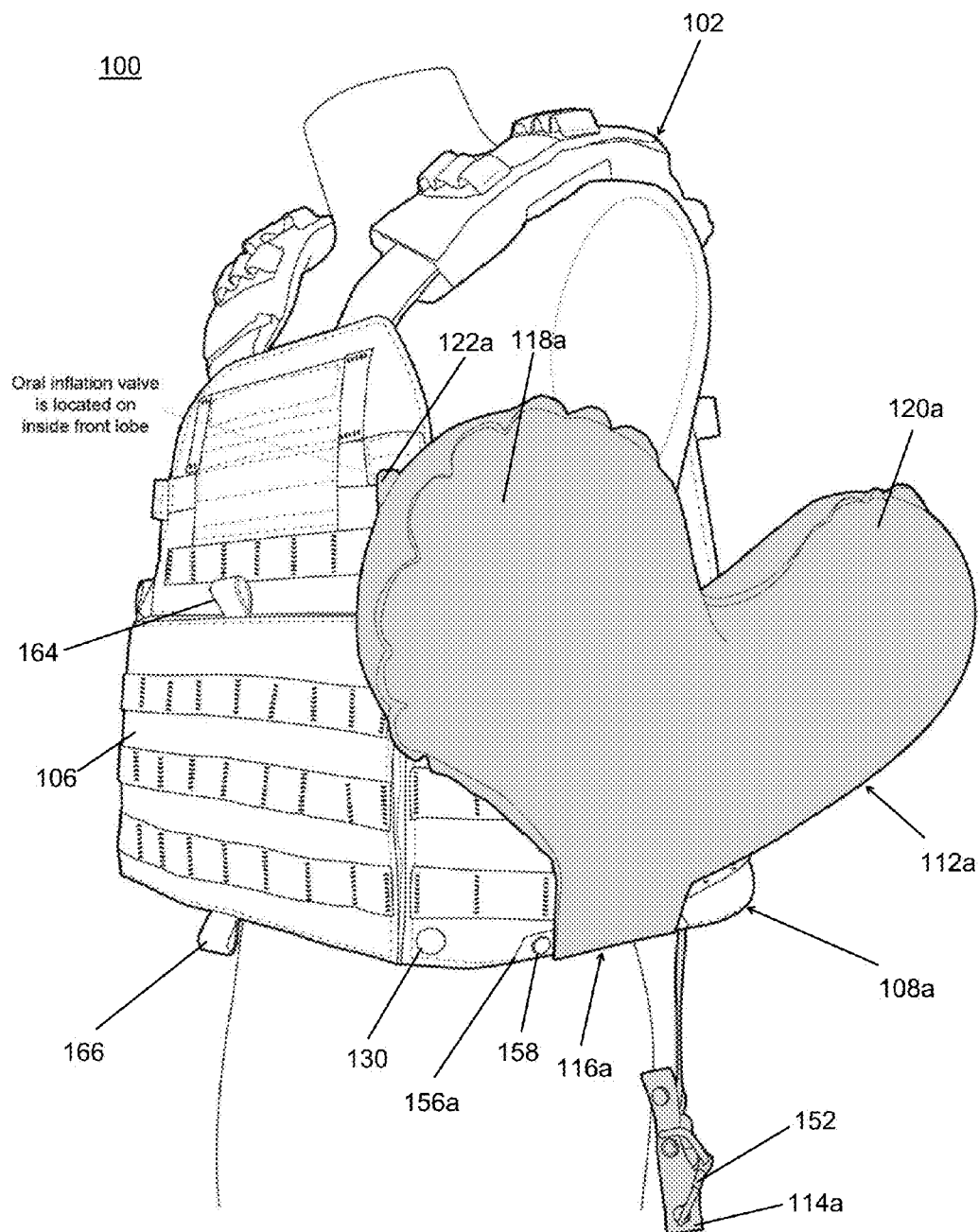


FIG. 2

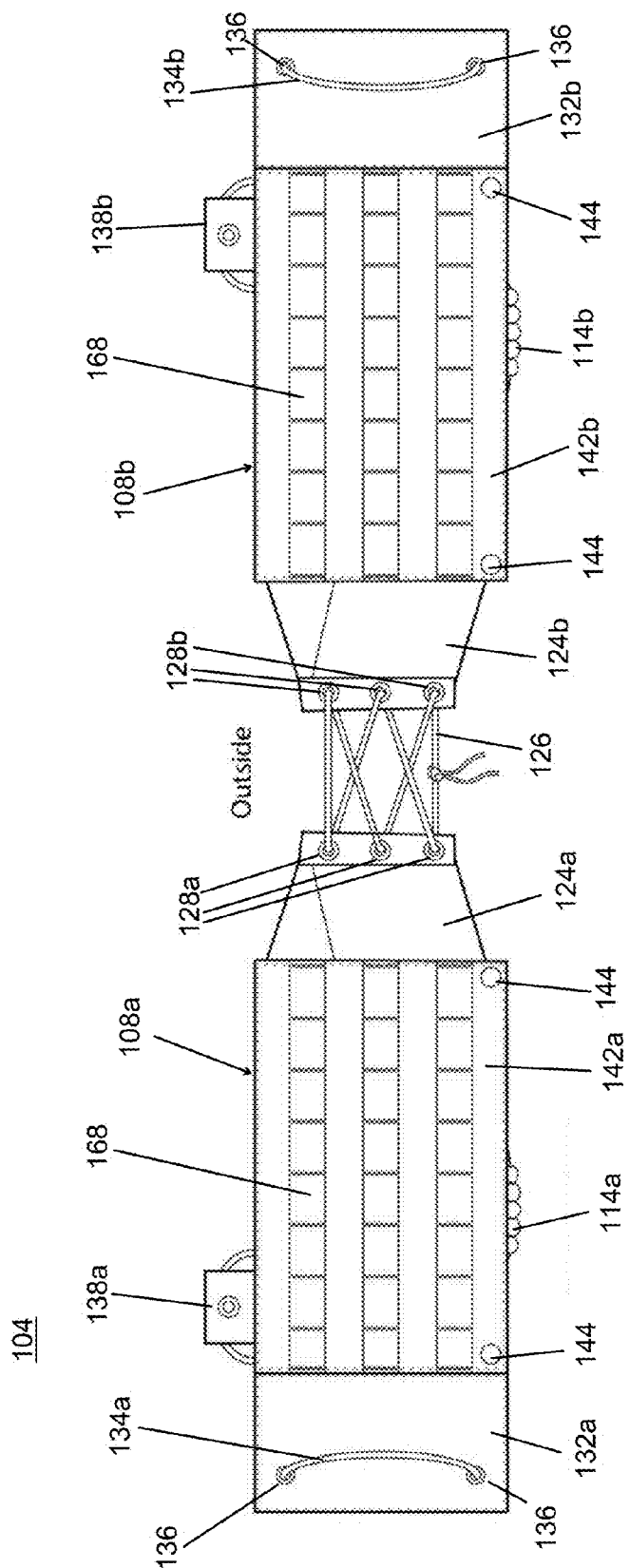
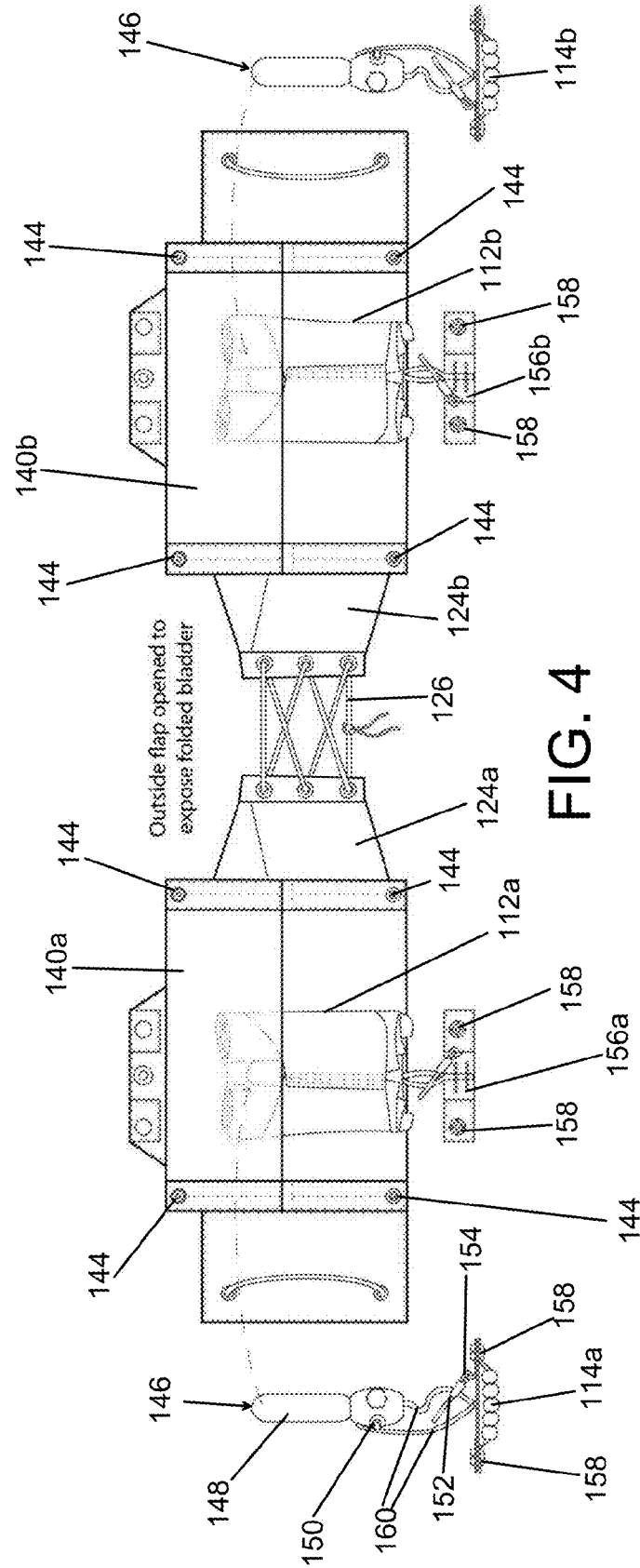


FIG. 3



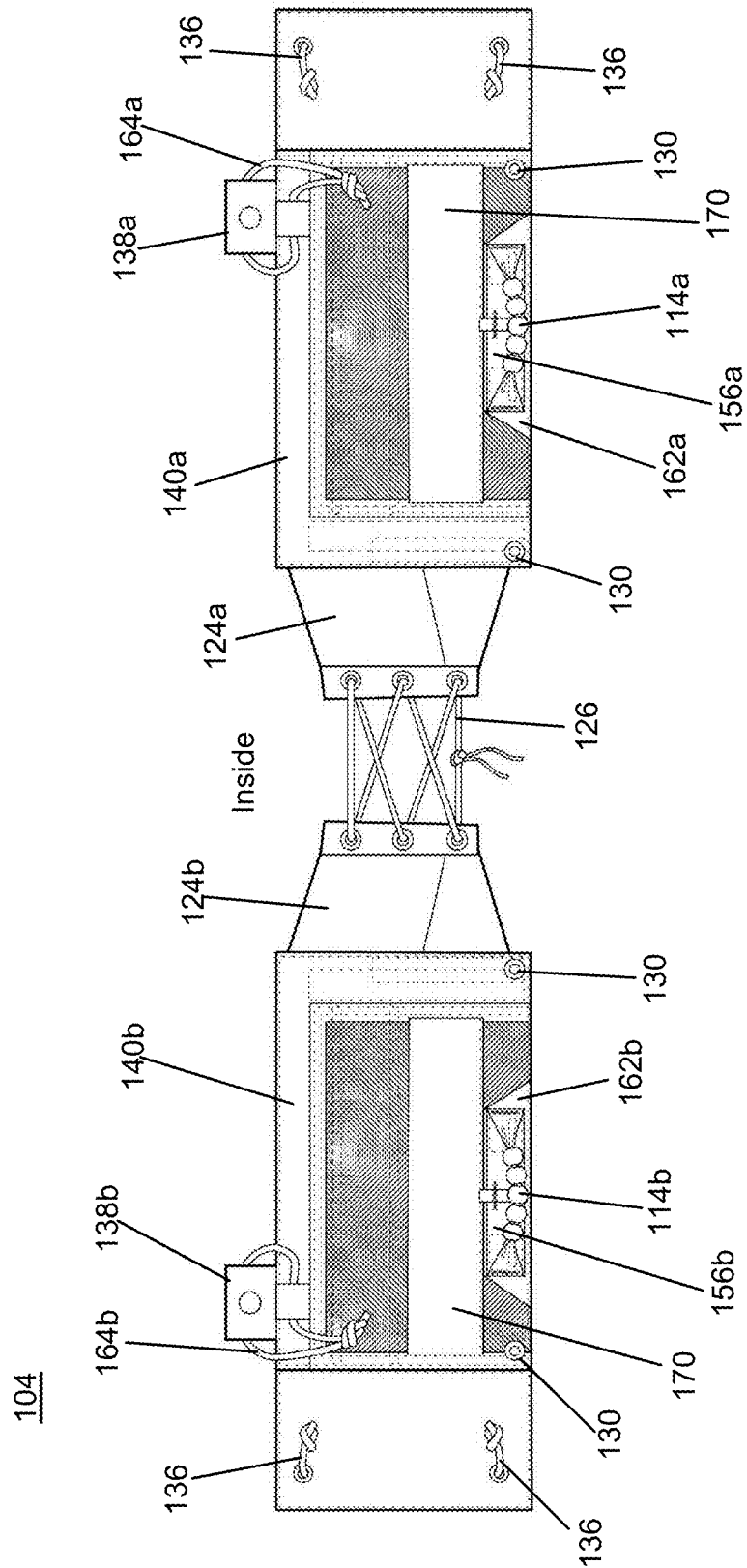


FIG. 5

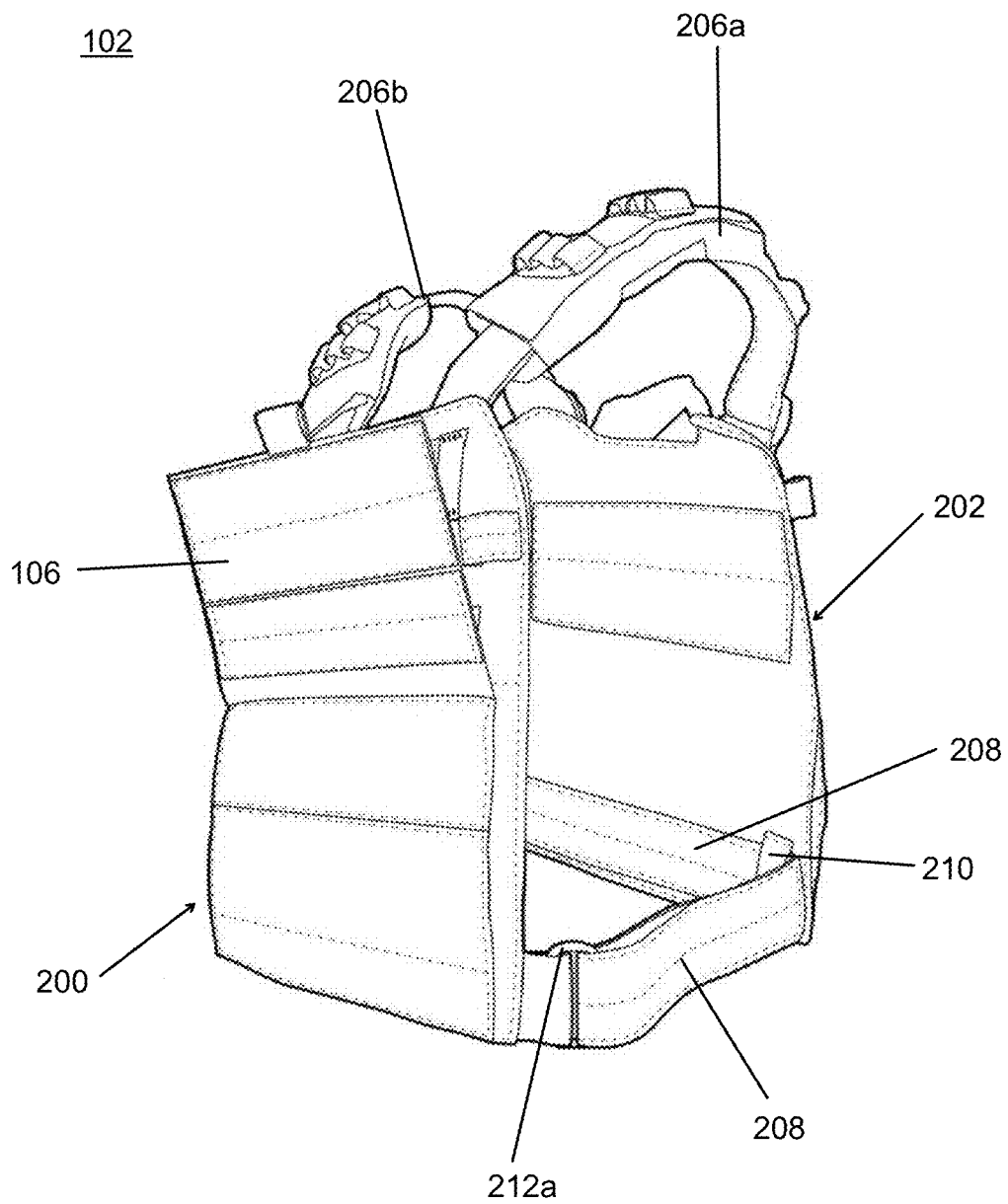


FIG. 6

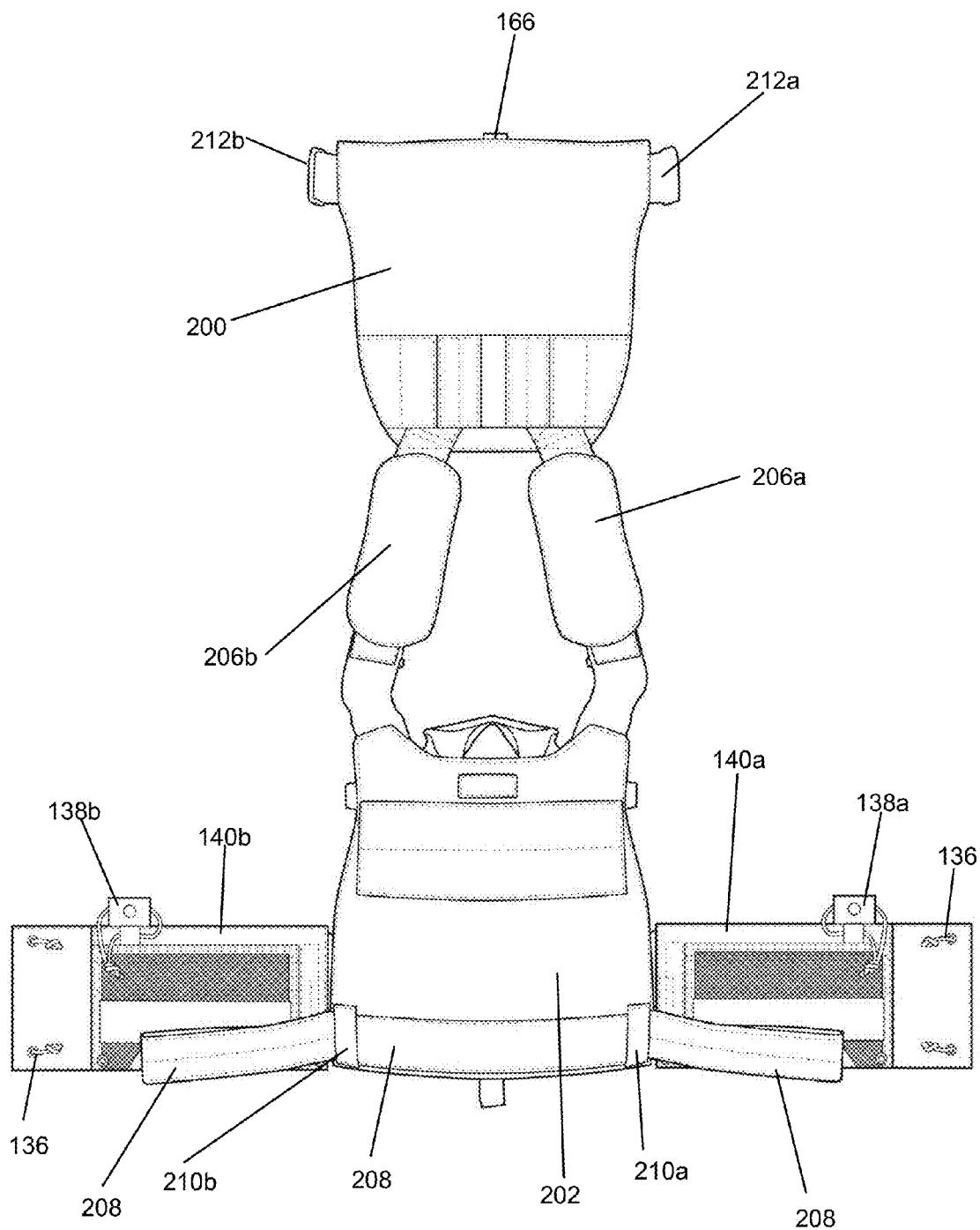


FIG. 7

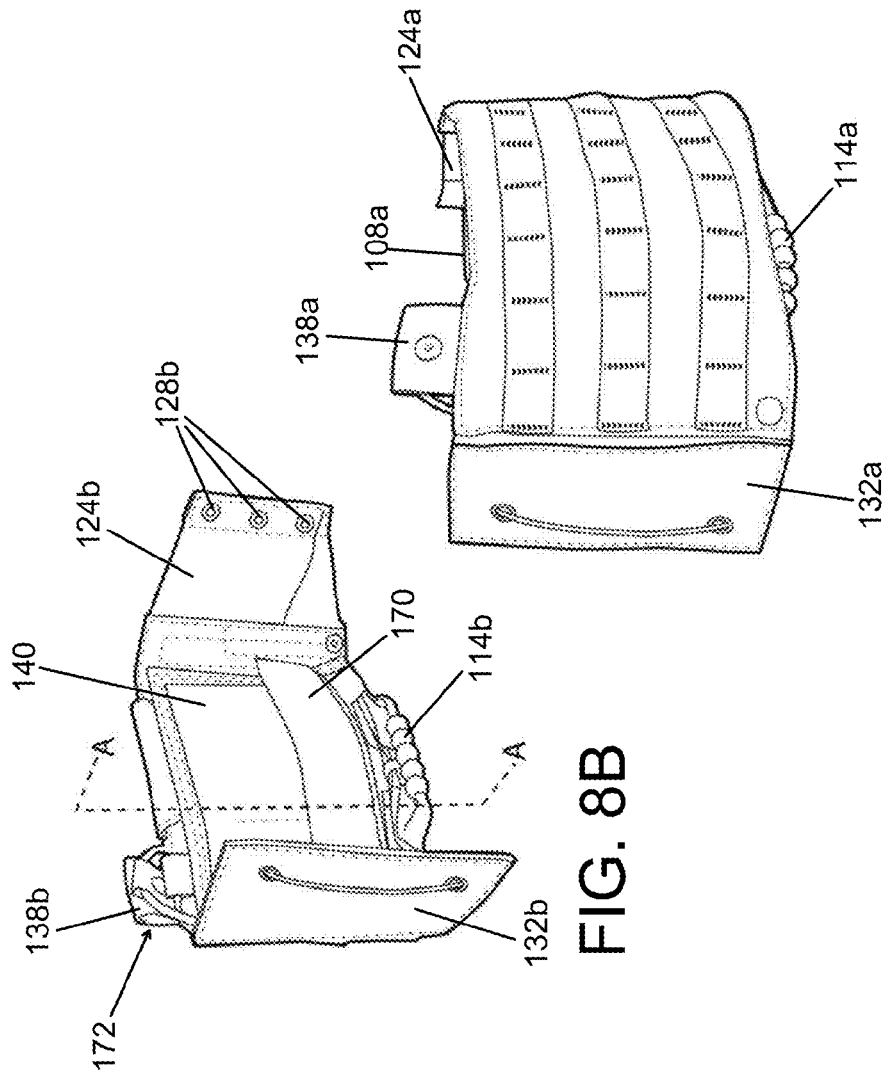


FIG. 8A

FIG. 8B

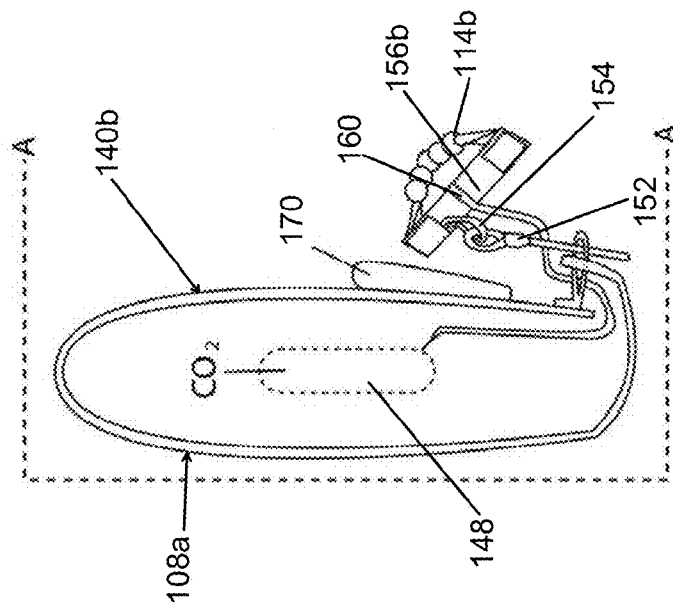


FIG. 8C

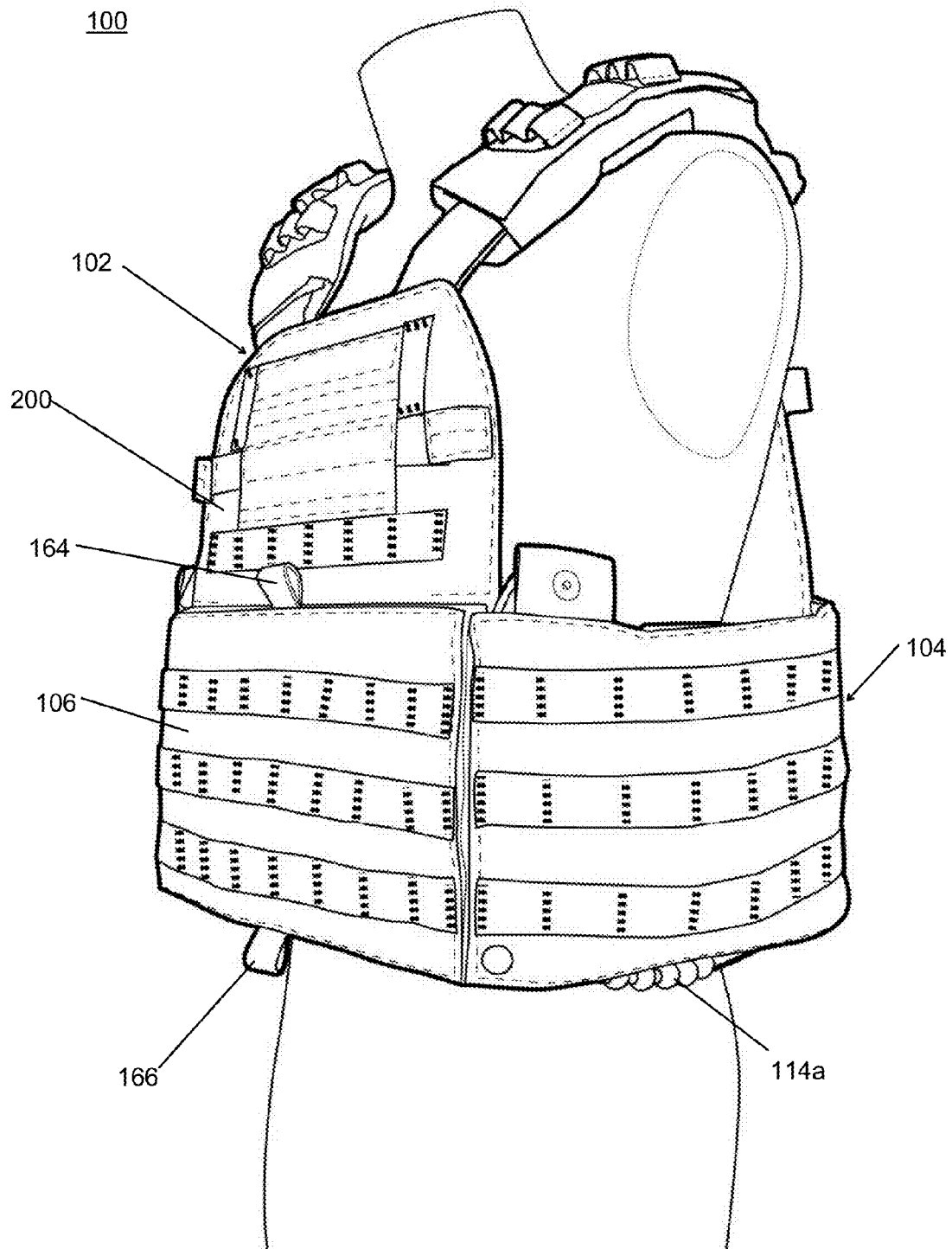


FIG. 9

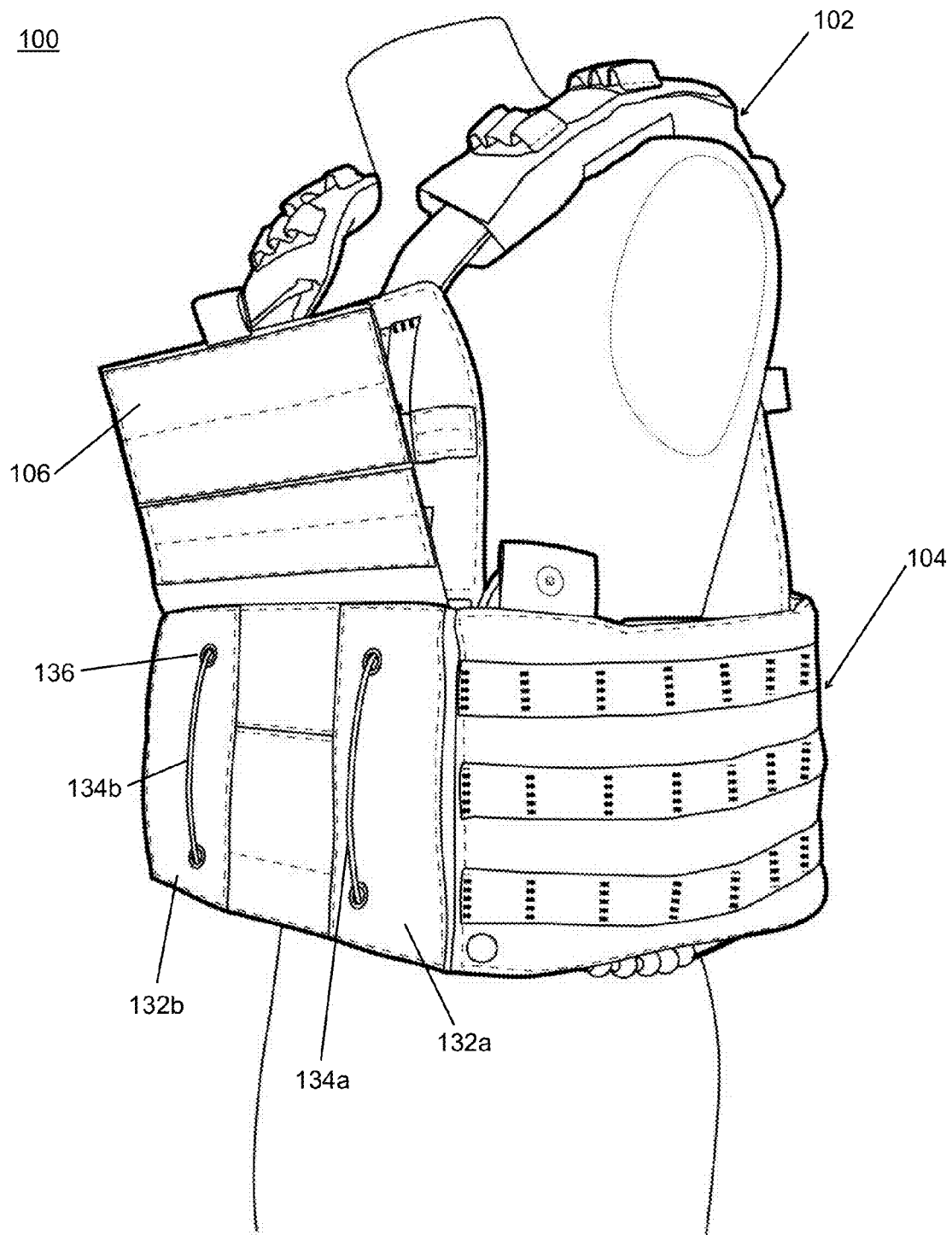


FIG. 10

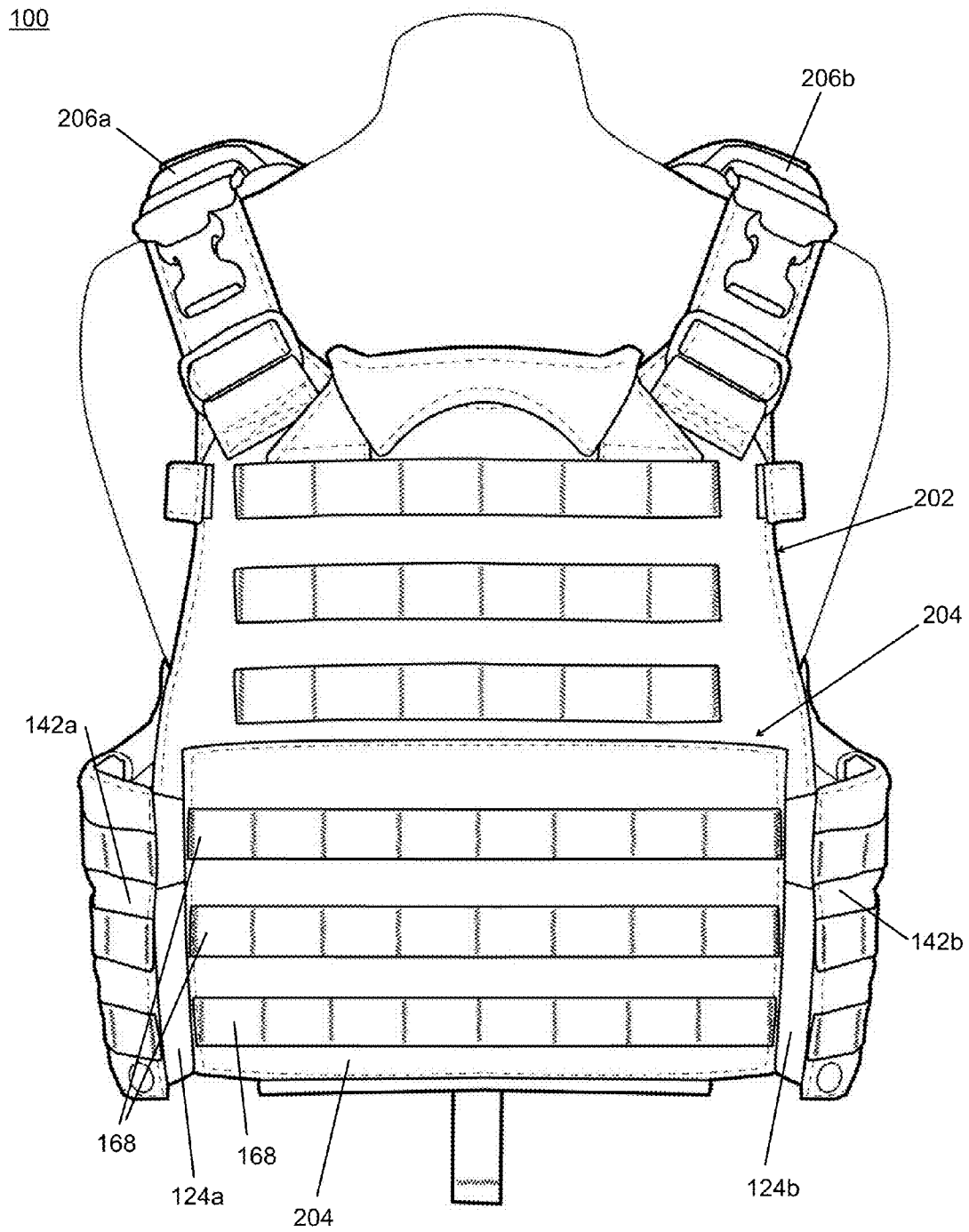


FIG. 11

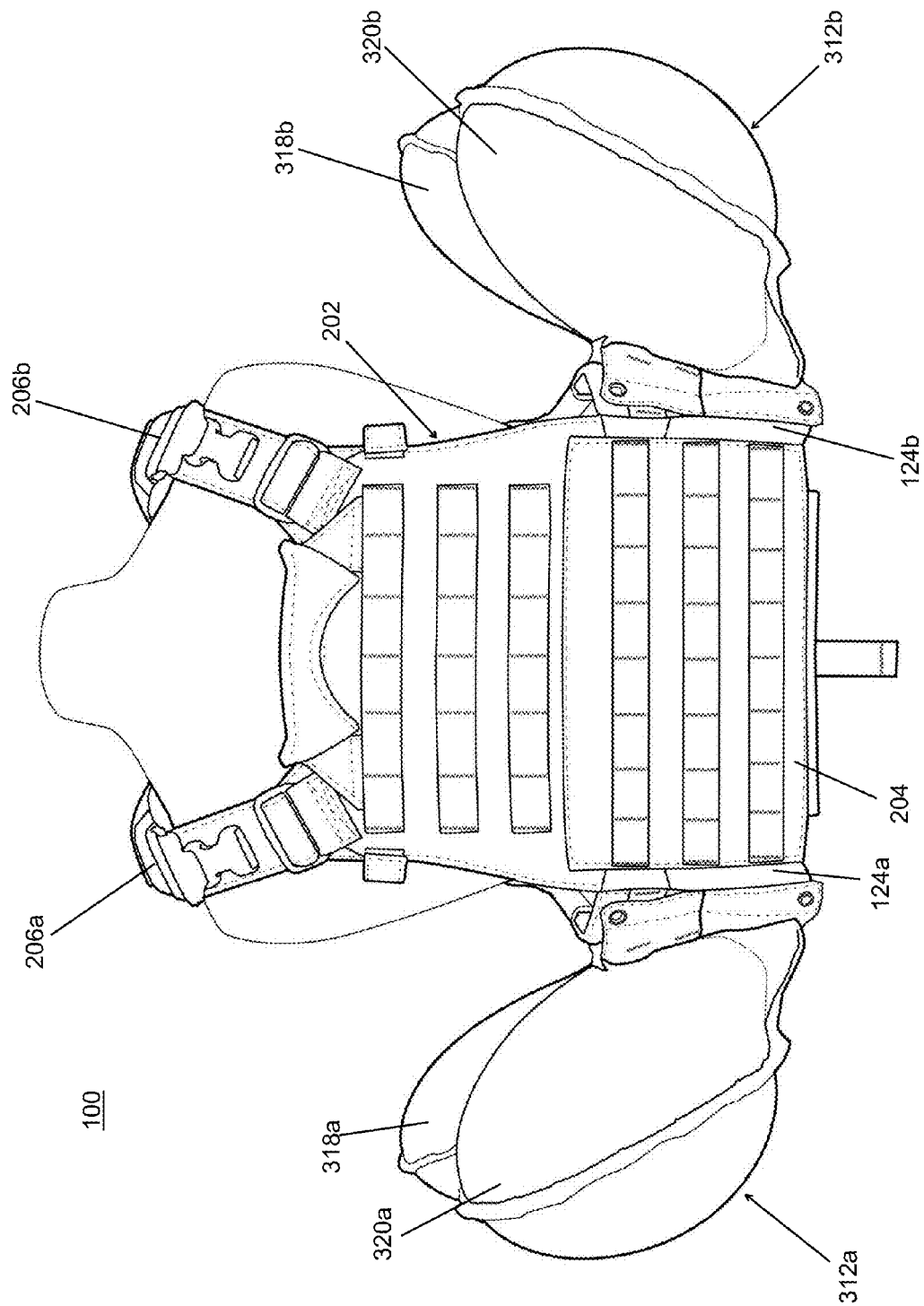


FIG. 12

TACTICAL FLOTATION SAFETY SYSTEM

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation of U.S. application Ser. No. 13/468,829 filed May 10, 2012, which claims priority to U.S. Provisional Application Ser. No. 61/484,394 filed May 10, 2011. This application is also related to U.S. Provisional Application No. 61/599,711 filed Feb. 12, 2012. Each of the aforementioned applications is incorporated herein by reference in its entirety.

BACKGROUND

The present disclosure relates to an improved tactical flotation safety system having a flotation safety vest attachment and method for adapting a tactical vest for use as a flotation device. The flotation safety vest attachment disclosed herein may advantageously be used in conjunction with a military or tactical field vest. However, it will be recognized that the present tactical flotation safety system may be used to help users float when immersed in water under a variety of circumstances. Without limiting the foregoing, the present tactical flotation safety system may be adapted for attachment to a variety of articles worn by people, or, alternatively, may be adapted for use independently.

SUMMARY

A tactical vest to be worn about the torso region of a user includes a front panel, a rear panel, and first and second spaced apart shoulder straps. Each of the first and second shoulder straps secures an upper end of the front panel to an upper end of the rear panel. A first side panel extends between the front panel and the rear panel. A second side panel opposite the first side panel extends between the front panel and the rear panel. Each of said first and second side panels define a covering which houses an inflatable bladder when the bladder is in a deflated condition and a source of compressed gas coupled to the inflatable bladder. An actuator is coupled to each of the inflatable bladders for selectively inflating the inflatable bladders when necessary.

In one aspect of the present disclosure, a tactical flotation safety vest system for enabling its wearer to float when submerged in water is provided.

In a more limited aspect, a method for converting a tactical vest into a flotation safety system, e.g., for use as a life vest, using a military, law enforcement, or like tactical vest is provided.

One advantage of the present flotation safety vest attachment resides in its compatibility with existing tactical vests.

Another advantage of the present development is that the tactical flotation safety vest attachment is compact and may be deployed with very little effort on the part of the user.

Still further advantages will become apparent to those of ordinary skill in the art upon reading and understanding the detailed description of the preferred embodiments.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention as claimed. The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate embodiments of the invention and, together with the

BRIEF DESCRIPTION OF THE DRAWINGS

The invention may take form in various components and arrangements of components, and in various steps and arrangements of steps. The drawings are only for purposes of illustrating preferred embodiments and are not to be construed as limiting the invention.

FIG. 1 is a perspective view of the tactical flotation vest attachment according to an exemplary embodiment of the present invention operably coupled to a tactical vest.

FIG. 2 is a perspective view of the tactical flotation vest attachment and tactical vest appearing in FIG. 1 with one of the inflatable bladders deployed.

FIG. 3 is an elevational view of the outward facing side of the tactical flotation vest attachment.

FIG. 4 is a partially exploded view of the tactical flotation vest attachment of FIG. 3, with the outside flaps opened to illustrate the bladders and the deployment mechanism.

FIG. 5 is an elevational view of the tactical flotation vest attachment showing the inward facing side of the flotation vest attachment.

FIG. 6 is a perspective view of the tactical vest of FIG. 1 with the front flap in the open position.

FIG. 7 is a plan view of the tactical vest of FIG. 6 having the front portion of the tactical vest in a flipped up position and having the panels of the tactical flotation vest attachment attached to the rear portion of the tactical vest and showing the interior of the tactical vest and tactical flotation vest attachment.

FIG. 8A is a perspective view of the left side tactical flotation vest attachment.

FIG. 8B is a perspective view of the interior of the right side tactical flotation vest attachment.

FIG. 8C is a cross-section view taken along the lines A-A of FIG. 8B.

FIG. 9 is a perspective view of the tactical flotation vest attachment and tactical vest appearing in FIG. 1.

FIG. 10 is a perspective view of the tactical flotation vest attachment and tactical vest appearing in FIG. 1 with the front panel in the open position.

FIG. 11 is a rear view of the tactical flotation vest attachment according to an exemplary embodiment of the present invention operably coupled to a tactical vest.

FIG. 12 is a rear view of an alternative embodiment of the tactical flotation vest attachment and tactical vest appearing in FIG. 1 with both of the inflatable bladders deployed.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to FIGS. 1-12, and with particular reference to FIGS. 1, 2, and 9-12, there appears an exemplary tactical flotation safety system 100 of the present invention. The tactical flotation safety system 100 includes a tactical vest 102 and an inflatable flotation vest attachment 104. The flotation vest attachment 104 has a left side panel 108a and a right side panel 108b. As best seen in FIGS. 6 and 7, the tactical vest 102 includes a front side 200 having a front panel 106, a back side 202 having a rear panel 204, two straps 206a and 206b connecting the front side 200 to the back side 202 at the user's shoulders, and a belt 208 for securing the front side 200 and back side 202 together at the user's waist. In the exemplary depicted embodiment the belt 208 passes through loops 210a and 210b on the inside of rear panel 204 and through the buckles 212a and 212b, respectively, on the front side 200 of

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the tactical vest **102**. The front and rear panels of the tactical vest may include a ballistic-resistant material, such as a hard or soft ballistic panel or plate.

The front panel **106**, rear panel **204**, and side panels **108a**, **108b** may each have a one or more rows of webbing **168**, such as nylon webbing. In the exemplary depicted embodiment there are three rows of webbing per panel, e.g., attached at each end and at spaced apart intervals, e.g., at 1.5 inch intervals. The upper portion of the front side **200** and back side **202** of the tactical vest **102** may also have a plurality of rows of webbing **168**. In the exemplary depicted embodiment there is one row of webbing on the front side **200** and three rows of webbing on the back side **202**. The webbing **168** enables the user to attach various types of modular gear, pouches, body armor, holsters, etc., which they may need to the flotation vest **104** and the front panel **106**. It will be recognized that other webbing configurations are possible. The webbing grid **168** may be formed of nylon and may conform to promulgated standards, such as the Pouch Attachment Ladder System (PALS) or the like.

As best seen in FIG. 2-5, each side panel **108a** and **108b** also has a pull handle **114a** and **114b**, respectively. The pull handles **114a** and **114b** each engage an inflation bladder **112a** and **112b**, respectively, located within the left and right side panels **108a** and **108b**. When pull handle **114a** is tugged, the inflation bladder **112a** is released through an opening **116a** and inflates. Similarly, when pull handle **114b** is tugged, the inflation bladder **112b** releases through a like opening, not shown, on the user's right side and inflates. If the inflation bladder **112a** fails to inflate the user may manually inflate the inflation bladder **112a** using an oral inflation valve **122a** located on the bladder **112a**. Likewise, if the inflation bladder **112b** fails to inflate the user may also manually inflate the inflation bladder **112b** using an oral inflation valve. In the depicted preferred embodiment, the oral inflation valve is located on the front lobe so as to be positioned near the user's mouth.

In an alternative embodiment as best seen in FIG. 12, when pull handle **114a** is tugged, the inflation bladder **312a** is released thereby forcing the closures **144** to disengage and the outer flap **142a** to open and fold back onto itself as inflation bladder **312a** inflates. Similarly, when pull handle **114b** is tugged, the inflation bladder **312b** releases thereby forcing the closures **144** to disengage and the outer flap **142b** to open and fold back onto itself as inflation bladder **312b** inflates.

In the depicted preferred embodiments, the bladders **112a**, **112b** are generally heart-shaped including a front lobe **118a** and rear lobe **120a**, not shown for bladder **112b**, and the bladders **312a**, **312b** including a front lobe **318a**, **318b** and rear lobe **320a**, **320b**, thereby defining a space for the user's arms to extend between the front and rear lobes when the bladders are inflated. In certain embodiments, the bladder may be as described in my U.S. Pat. No. 7, 335, 078 issued Feb. 26, 2008, entitled "Tactical Flotation Support System," which is incorporated herein by reference in its entirety.

As best seen in FIGS. 3-5 and 8A-8C, and with continued reference to FIGS. 1, 2, 6, 7, and 9-12, the flotation vest attachment **104** has a left side panel **108a** and a right side panel **108b**, which in turn have a rear tab **124a** and a rear tab **124b**, respectively. The side panels **108a** and **108b** are secured together at the rear tabs **124a** and **124b**. In the preferred embodiment, the side panels **108a** and **108b** are attached using an adjustable corset type closure, although other closure means including hook and loop fasteners, straps, buckles, and the like are also contemplated. The adjustable corset closure has a string **126** which is alternately laced through a plurality of openings or eyelets **128a** and **128b** on the rear tabs

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124a and **124b**. In the depicted embodiment, each rear tab **124a** and **124b** has three eyelets **128a** and **128b**. The adjustable closure enables users to make the flotation vest attachment **104** larger or smaller based on the size of their body.

In use, the flotation vest attachment **104** wraps around the lower portion of the tactical vest **102** at the waist of the user. The rear tabs **124a** and **124b** of the flotation vest attachment **104** align with the lower back of the user and are secured to the tactical vest **102** using rear panel **204**. The side panels **108a** and **108b** of the flotation vest attachment **104** cover the user's sides. Advantageously, the rear tabs **124a** and **124b** are adapted to secure to the existing, complimentary rear panel **204**, allowing the flotation vest attachment **104** to be retrofit to existing vests **102**. However, it will be recognized that other types of fasteners could also be used, including buttons, hook and loop fasteners, zippers, ties, hooks, buckles, snap lock type fasteners, or the like. The side panels **108a** and **108b** of the flotation vest attachment **104** also include a left front tab **132a** and a right front tab **132b** which align generally with the abdominal region of the user. Advantageously, the front tabs **132a** and **132b** are adapted to secure to the existing, complimentary front panel **106**, allowing the flotation vest attachment **104** to be retrofit to existing vests **102**. Each front tab **132a** and **132b** has a cord **134a** and **134b** which attaches to the respective front tab **132a** or **132b** through openings **136**. The cords **134a** and **134b** may be used for easy removal of the front tabs **132a** and **132b** from the front side **200** of the tactical vest **102**. The tabs **164** and **166** are also provided to aid a user in quick and easy removal of the flotation vest attachment **104** from the tactical vest **102** when necessary.

The flotation vest attachment **104** may include a radio pouch **172**. The radio pouch **172** having a closure **138a** **138b** with a snap **174** for securing the radio within the flotation vest attachment. The radio pouch **172** may also have an optional lanyard **164a** **164b** which may be secured to a radio via an optional lanyard interface on the radio, not shown. While the lanyard and lanyard interface are optional, the use of a lanyard maybe advantageous in preventing damage to the radio, not shown, in the event it comes out of the radio pouch **172** or is dropped by the user.

As best seen in FIGS. 3, 4 and 8A-8C, and with continued reference to FIGS. 1, 2, 5-7, and 9-12, the side panels **108a** and **108b** each have an inner flap **140a** and **140b**, respectively, and an outer flap **142a** and **142b**, respectively. The outer flaps **142a** and **142b** are secured to the inner flaps **140a** and **140b** via closures **144**, which may be of the snap fit type although other fasteners, including buttons, hook and loop, etc. are also contemplated. When the inflation bladders **112a**, **112b**, **312a** and **312b** are undeployed they are folded and secured between the inner flaps **140a** and **140b** and the outer flaps **142a** and **142b** of the side panels **108a** and **108b**. An inflation mechanism **146** is attached to the side panels **108a** and **108b** and sits within each of the folded inflation bladders **112a**, **112b**, **312a** and **312b** to provide the mechanism for inflating the bladders **112a**, **112b**, **312a** and **312b** when the handles **114a** and **114b** are pulled. The handles **114a** and **114b** each have a rear attachment portion **156a** and **156b** which secures the handles **114a** and **114b** to the inner flaps **140a** and **140b**, respectively, at attachment flaps **162a** and **162b** using closures **158**.

Each inflation mechanism **146** has a pressurized gas (e.g., carbon dioxide) canister or cartridge **148**. The outlet of the cartridge **148** is coupled to a valve **150**. The valve **150** may be threaded valve for receiving an threaded end of a gas canister such as a CO₂ cartridge and a piercing pin mechanically coupled to the handle **114a** or **114b**. The valves **150** are also coupled to an inlet of the bladders **112a**, **112b**, **312a** and **312b** to enable the gas stored in the canisters **148** to fill the bladders

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112a, 112b, 312a and 312b when the handles 114a, 114b are pulled. When a user pulls the handles 114a, 114b, the pins 152 which attach to the rear attachment portions 156a, 156b of the handles 114a, 114b at hooks 154 disengage the valve members 150, thereby opening the valves 150 and allowing the gas from the canisters 148 to inflate the bladders 112a, 112b, 312a and 312b. The rear attachment portions 156a, 156b of the handles 114a, 114b also connect to one or more cords 160 at a first end to prevent the handles 114a, 114b from being lost after they are pulled to deploy the bladders 112a, 112b, 312a and 312b. The cords 160 connect at a second end to the connection member 150 at one or more different points and the connection member 150 attaches to the inner flaps 140a, 140b of the side panels 108a, 108b. In the exemplary depicted embodiment of FIG. 4 there are two cords 160. In the alternative exemplary depicted embodiment of FIGS. 8A-8C there is one cord 160. A comfort pad or anti-chaffing pad 170 is attached to the inner flaps 140a and 140b providing a cushion between the inflation mechanism 146 and the users sides.

The flotation vest attachment 104 may also be equipped with an automatic inflation switch, not shown, which causes the inflation mechanism 146 to automatically activate and fill the bladders 112a, 112b, 312a and 312b when the automatic inflation switch is completely submerged in water. For example, the switch may comprise spaced apart electrodes or contacts which are triggered when water bridges the contacts, or any other electronic actuator which senses water. Advantageously, accidental or inadvertent inflation may be prevented by delaying the automatic inflation until the switch has been fully submerged in water for a prespecified period of time prior to activating the inflation mechanism 146, e.g., by providing an outer covering over the sensor which slows the rate at which water reaches the switch or sensor. The automatic inflation of the flotation vest attachment 104 enables the flotation vest attachment 104 to be inflated when the user is submerged in water and unable to manually activate the inflation of the bladders 112a, 112b, 312a and 312b using the handles 114a and 114b.

In alternative embodiments, auto-inflation may be provided using an auto actuator be of the type which uses a compressed member such as a spring which is actuated in the presence of water (e.g., by using a soluble bobbin or pill) which, in turn, drives a piercing member to pierce the cartridge and to allow the pressurized gas to enter the bladder chamber. In an especially preferred embodiment, delayed inflation may be provided by enclosing the soluble bobbin within a water resistant cover so as to slow or delay the entry of water. In this manner, environmental moisture such as rain, water spray, or the like will not cause inadvertent inflation of the bladder, but which will admit water to actuate the auto-inflation in the event of submersion in water. The auto-actuator may be of the type commercially available from Halkey-Roberts and others.

The invention has been described with reference to the preferred embodiments. Modifications and alterations will occur to others upon a reading and understanding of the preceding detailed description. Therefore, it is not desired to limit the invention to the specific examples disclosed or the exact construction and operation shown and described. Rather, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed is:

1. A tactical vest to be worn about the torso region of a user, comprising:
 - a front panel;
 - a rear panel;

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first and second spaced apart shoulder straps, each of said first and second spaced apart shoulder straps securing an upper end of the front panel to an upper end of the rear panel;

- a first side panel extending between said front panel and said rear panel and covering a portion of a first side of the user's torso when the user is wearing said tactical vest;
- a second side panel opposite the first side panel extending between said front panel and said rear panel and covering a portion of a second side of the user's torso when the user is wearing said tactical vest;

each of said first and second side panels defining a covering housing an inflatable bladder when the bladder is in a deflated condition and a source of compressed gas coupled to said inflatable bladder; and

an actuator coupled to each of said inflatable bladders for selectively inflating said inflatable bladders.

2. The tactical vest of claim 1, further comprising:

said first side panel having a first tab for removably securing the first side panel to the front panel, wherein a first peripheral edge of the covering defined by the first side panel coincides with a peripheral edge of said front panel; and

said second side panel having a second tab for removably securing the second side panel to the front panel, wherein a first peripheral edge of the covering defined by the second side panel coincides with a peripheral edge of said front panel.

3. The tactical vest of claim 2, further comprising:

said first side panel having a first rear tab for removably securing the first side panel to the rear panel, wherein a second peripheral edge of the covering defined by the first side panel coincides with a peripheral edge of said rear panel; and

said second side panel having a second rear tab for removably securing the second side panel to the rear panel, wherein a second peripheral edge of the covering defined by the second side panel coincides with a peripheral edge of said rear panel.

4. The tactical vest of claim 3, further comprising:

a hinged flap attached to the front panel movable between an open position and a closed position, said hinged flap covering said first and second front tabs when the hinged flap is in the closed position.

5. The tactical vest of claim 1, wherein said source of compressed gas is a carbon dioxide cartridge.

6. The tactical vest of claim 1, wherein each of said first and second side panels includes a mechanical actuator for opening a valve to allow the compressed gas to enter said bladder.

7. The tactical vest of claim 1, further comprising:

an oral inflation valve for allowing a user to orally inflate said bladder during use.

8. The tactical vest of claim 1, wherein said actuator coupled to each of said inflatable bladders for selectively inflating said inflatable bladders includes a valve including a piercing pin for selectively providing a fluidic coupling between said bladder and said source of compressed gas.

9. The tactical vest of claim 1, wherein said actuator coupled to each of said inflatable bladders for selectively inflating said inflatable bladders includes a valve which includes a water soluble bobbin for automatically inflating the bladders when said actuator is submerged in water and the water soluble bobbin dissolves.

10. The tactical vest of claim 1, wherein said actuator coupled to each of said inflatable bladders for selectively

inflating said inflatable bladders includes a valve which includes a water sensor for electronically detecting the presence of water.

11. The tactical vest of claim **10**, wherein said water sensor is an electrical switch which is closed in the presence of water. 5

12. The tactical vest of claim **1**, wherein said actuator is configured to which automatically inflate in the presence of water, said actuator further comprising a covering receiving the actuator for slowing the entry of water into the cover.

13. The tactical vest of claim **1**, wherein one or both of the 10 front panel and the rear panel include a ballistic-resistant material.

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